

RESEARCH CAPACITY STRENGTHENING FOR ESSENTIAL NATIONAL HEALTH RESEARCH (ENHR)



COUNCIL ON HEALTH RESEARCH FOR DEVELOPMENT



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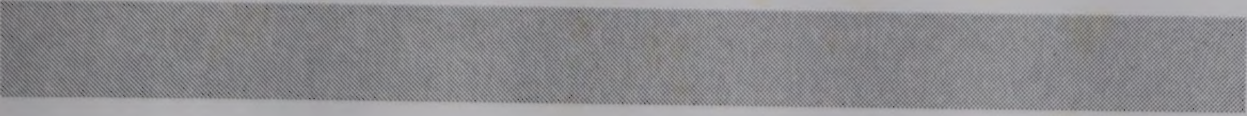
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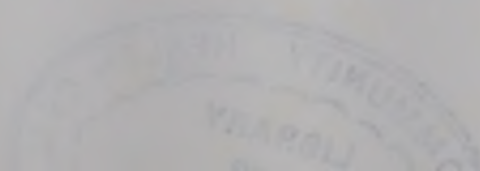
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Research Capacity Strengthening for Essential National Health Research (ENHR)

**Council on Health Research for Development
(COHRED)**



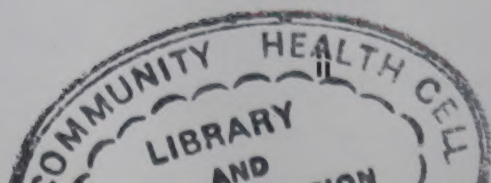
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CHAPTER ONE:

Introduction

“Strengthening research capacity in developing countries is one of the most powerful, cost effective and sustainable means of advancing health and development.”

COMMISSION ON HEALTH RESEARCH FOR DEVELOPMENT

Developed countries have benefited greatly from the increase in knowledge and the advance-ment of technology derived from scientific research. Both developments have been important for the conquest of major diseases and have resulted in a steady flow of improvements in health and welfare. Developing countries have also profited significantly, but initially were dependent on the scientists and institutions of developed countries. Now many of them are in the process of building indigenous research capacity to study their own health problems and to contribute to global knowledge.

Following an extensive review of the health situation in developing countries, an independent group of experts, the Commission on Health Research for Development, noted that there was inadequate investment in research on the major health problems affecting people in developing countries, and that frequently health services in these countries did not apply relevant research findings with sufficient promptness and vigour. In its report¹ the Commission recommended that every developing country should intensify its health research programmes, and develop an integrated strategy for research which it named “Essential National Health Research” (ENHR). Following the completion of the work of the Commission in June 1990, a Task Force on Health Research for Development, comprised of senior scientists from developing and developed countries, was established to promote and implement the Commission’s key recommendations. The Task Force has stimulated the initiation of ENHR strategies in a number of countries, sponsored pilot activities, facilitated the exchange of information and compiled the accumulated experience of countries who have decided to reform their health research systems.

Analysis and discussion of these early experiences led to a more detailed elaboration of the concept of ENHR. In 1991 the Task Force produced a manual, *A Strategy for Action in Health and Human Development*², which outlined a generic process for the implementation of ENHR and gave examples of the early experiences of several nations. Many developing countries are now reviewing policies and plans for health research in light of the Commission's report, and over 25 countries have taken steps to implement the ENHR Strategy. There is both an increase in the amount of health research and, more importantly, a reorientation of its goals, contents and management.

The recent publication of the World Bank's 'World Development Report 1993' (WDR 93) on "Investing in Health" has drawn attention to the urgent need to reform the health systems in developing countries. The report identified major problems in the operation of health services including misallocation of public money, inequity in access to basic health services, inefficient operation in the public sector, waste of public resources and exploding costs. The Bank recommended policy reform in the health sector aimed at improving the health status of people in developing countries, especially of the poor, and at controlling public spending. The report proposed the use of the "Disability Adjusted Life Year" (DALY), which combines the losses due to premature death and to disability, as a new measure of the burden of disease. The report illustrated the use of the DALY as an objective means of ranking the cost-effectiveness of health interventions through estimation of the amount of DALY's gained per unit cost. Successful implementation of the specific recommendations in the WDR 93 report depends on the ability of governments to make informed decisions that are based on objective analysis of good data and which use scientific research to analyze and solve problems.

The report has generated extensive debate and discussion and it has stimulated efforts to follow up and implement its main recommendations. In October 1993, a conference in Ottawa, Canada, on "Future Partnership for the Acceleration of Health Development" addressed major issues raised in the WDR 93. Co-sponsored by the International Development Research Centre (IDRC) Canada, the World Health Organization (WHO) and the World Bank, participants included individuals from developing countries as well as representatives of multilateral and bilateral development assistance agencies, international organizations and foundations. The participants endorsed the WDR 93's call for health policy reform both in developed and developing countries; the need to redirect investments both at the national and international levels; and the recommendation to "strengthen the relevance, quality

and contribution of health research for health reform". They emphasized that countries need to build and strengthen the capacity to undertake health policy reform and to use of health research as an essential tool for redirecting health investments to the most relevant and cost-effective interventions.

The importance of knowledge-based and science-based decisions at every level of the health services

There is a growing convergence of views about the need to undertake urgent reform of the health sector, basing critical decisions on objective scientific analysis of available data and on the results of well designed scientific research. The objective and orientation of the ENHR Strategy is to ensure that national health agendas are founded on scientific knowledge and based on scientific methods. This theme of ENHR is played with many national variations, but with the strengthening of research capacity as a constant motif. This report is intended to provide illustrated guidelines; it reviews issues and principles and gives numerous examples of their application in practice. It draws on the accumulated experience of current and past capacity strengthening programmes in developing countries, and highlights lessons from successes and failures. It is intended for use by governments, especially those of developing countries; agencies concerned with health and development; and others involved in applying the concepts of ENHR. Needs and strategies are reviewed in Chapter 2. The framework for capacity strengthening, extending from the community and the primary level of health care to dedicated research institutes, is considered in Chapter 3. Lessons from past experience on national commitment, training and institutional development are examined in Chapter 4, and implementation of the ENHR strategy is described in Chapter 5.

CHAPTER TWO:

Research Capacity

“Every country, no matter how small and poor, should establish a research base to understand its own problems, to enhance the effectiveness of limited resources and to improve policy and management.”

COMMISSION ON HEALTH RESEARCH FOR DEVELOPMENT

The development and implementation of the ENHR Strategy is dependent on the collective efforts of people from many strata of society; community members, health care providers, scientists and technicians from many disciplines, research administrators, government officials and others. These people and their organizations constitute a country's health research capacity.

2.1

Needs and Opportunities

In adopting a health research policy based on the ENHR Strategy each country should consider:

- the epidemiological patterns of diseases and associated risk factors;
- variations in the patterns of health and disease between and within regions and districts;
- vulnerable groups as defined by economic, social and cultural factors;
- human resources, especially the availability of skilled researchers in various disciplines;
- the national level of technological development and the availability of infrastructural support for research projects;
- the translation and dissemination of research results to users in the planning and implementation of health action through public and private sectors; and

- the availability of financial resources for research from both national and external sources.

At present, research output in developing countries is very low and accounts for merely 5% of global research publications. Research in these countries is mainly in the areas of clinical and laboratory sciences, and is largely descriptive; because of the orientation of individual researchers and research institutions few studies have been directed towards health policy and action. Science and technology are underdeveloped and poorly funded; and the links between research and improvements in health are poorly appreciated by researchers and health professionals. There is no social perception of the need for these links. There are few incentives for applied interdisciplinary research, and little attention is paid to the need for presenting research results in ways which are comprehensible to the users.

Limitations relating to researchers include:

- inadequate research training;
- intellectual isolation;
- low salaries and few possibilities for promotion;
- absence of or limited career paths; and
- restricted choice of research topics

Institutional deficiencies include:

- inadequate staff;
- institutional instability;
- inadequate facilities;
- lack of access to information; and
- lack of perception of the relevance of research to the solution of health problems.

Deficiencies at the national level include:

- lack of demand for research and scientific information;
- lack of perception of the relevance of research to the solution of health problems;
- poor public understanding and support;

- bureaucratic rigidity;
- inadequate funds;
- lack of political commitment;
- absence of an agreed plan for health research, and changes in research policy due to political instability; and
- lack of support from external funding agencies for research capacity building to meet national needs and priorities

Deficiencies vary among countries. The **more advanced developing countries** have established science and technology policies in various sectors including health, their research laboratories are furnished with modern equipment and staffed with highly trained scientists and technicians working in key disciplines, and they have developed information systems and other forms of logistic support necessary for high quality research. Deficiencies tend to be insufficient research funds and inadequate appreciation of the breadth of research and the research coordination required to promote health and development. There is frequently little contact between communities, research professionals and the government with regard to health problems. More advanced developing countries need to strengthen those research programmes that are aligned to the goals of ENHR and to redirect others that do not fit well with ENHR priorities. There is a need to promote multidisciplinary and intersectorial collaboration and to develop ways to rapidly translate new knowledge and research findings into actions for health.

The **less advanced developing countries** with moderate scientific and technological resources have a more limited research capacity. Often their main research resource is to be found in a medical school or in a few field projects. In addition to the problem of isolation, typical areas requiring development are breadth of scientific expertise, institutional infrastructure and information systems

The **least developed countries** have minimal research capacity. Their few trained scientists necessarily work in isolation, often lacking suitable technical and institutional support and the complementary expertise of colleagues in other disciplines. These countries are largely dependent on foreign experts and visiting teams. They need to identify their highest priority health problems and begin to build scientific capacity accordingly.

The less advanced and the least developed countries can learn useful lessons from the more advanced countries on the building of national research capacities, and in particular on how to avoid those types of institutional arrangements which have in the past presented obstacles to cross-disciplinary collaboration.

2.2

The Concept of National Health Research Capacity

In the past, national capacity for health research has usually been defined in terms of lists of abilities to undertake specific activities. These activities may cover important topics, but such lists do not directly relate to ENHR strategies, which are based on the following:

- identification of national problems and priorities for the promotion of health and development, and the establishment of research capacities and programmes to solve these problems;
- creation of a stimulating and functional research environment and research culture at national, institutional and personal levels so as to create a national demand for research, and attraction of researchers to work on national projects in their own countries;
- creation of national mechanisms to enhance interaction and information exchange between scientists, and breaking down the barriers between the scientific community, the people, policy makers and industry. Mechanisms are also required to translate research findings into technologies and approaches which will advance national health development. The latter include fostering of community participation, collating findings from different disciplines as well as new methods of management and new systems for health care delivery;
- participation in global research, and development of capability to benefit from global knowledge and research findings; and
- development of plans for external support for those national health research components for which a country may lack the financial, technological and human resources.

2.3

Building National Health Research Capacity

The needs and strategies for capacity building and strengthening can best be identified by reference to the objectives, content and methods inherent in the ENHR strategy and by seeking answers to such questions as:

- What research capacities are required for implementing an ENHR strategy, and how do these differ from current capacities?
- What specific features of ENHR influence choices and strategies for capacity strengthening?
- What are the most appropriate institutional arrangements to promote research on a multidisciplinary and intersectoral basis?
- What changes are required to human and institutional resources to enable them to serve the needs of ENHR more effectively?
- What arrangements are needed to ensure the meaningful participation of all relevant groups – researchers, health care givers and community representatives – in selecting priorities, mobilizing resources, carrying out research and utilizing research findings?

The potential disciplinary scope of ENHR is wide, including:

- clinical and biomedical sciences, including biology, biochemistry, immunology, and molecular biology;
- epidemiology and statistics;
- microbiology, parasitology and entomology;
- social and behavioural sciences, including sociology, anthropology, geography and psychology;
- management and communication sciences with various sub-disciplines;
- economics and political science with various sub-disciplines; and
- engineering and environmental sciences with various sub-disciplines.

Intersectoral linkages and approaches are also important in the identification of research which is relevant to health development. ENHR strategies may influence the agenda for national research in the agriculture and education sectors and vice versa.

The research topics of ENHR include the following:

- **Situation analysis.** This includes studies of the distribution of health and disease, as well as of health care, in order to set priorities for action aimed at equitable health development. It is a continuous process of gathering and analyzing data about communities, including people's perceptions of health and disease. Based on these data, the major determinants of health and disease in various segments of the population can be assessed; biological, behavioural, social, economic and environmental risk factors and vulnerable groups can be identified; changes can be monitored and trends projected; and epidemics recognized and combatted.
- **Health systems research.** This seeks to design the most effective strategies for interventions to improve health and to enhance their impact. Topics include the following: need; the demand for and utilization of health services; the efficiency and cost-effectiveness of health interventions; evaluation and selection of technologies; the assessment of the effectiveness of different combinations of medical, social and other non-medical interventions; the design and testing of alternative approaches to the delivery of health care and the financing of health services; and, in the cause of equity, the search for ways to improve services to vulnerable, poor and disadvantaged people.
- **Development of new and improved technologies and interventions.** This includes: the search for new biomedical tools such as drugs, vaccines, diagnostic tests and environmental control measures to control biological, chemical and physical hazards; the discovery and development of tools for disease control that are safe, simple to use, acceptable to communities and affordable; and the development of social, educational and other interventions relevant to improved health.
- **Broadening basic knowledge of biology and human behaviour.** This includes better understanding of biological processes in health and disease; of the biology of infective agents and their vectors; of the role of genetic factors in resistance and susceptibility to disease; and advances in the understanding of health-related human behaviour.

2.4

Country-Specific and Global Health Research

The Commission on Health Research for Development classifies research according to national and global relevance.

- **Country-specific research** identifies the main diseases and conditions that continue to impose an unnecessary burden on society, assesses the effectiveness of control measures, and identifies technical and cultural obstacles to successful implementation of health programmes. It provides a deeper understanding of the function of the health services, identifies gaps in coverage and access and helps to promote equity. It provides insights into the impact on health of policies in other sectors. It enables health authorities to monitor and understand trends in the process of health transition. It deals with local health problems, identifies risk factors and high-risk groups and helps to design the most cost-effective interventions in the context of local needs and resources. It assists policy makers in assessing the current situation and projecting future trends.
- **Global health research** includes: the discovery and development of new preventive, diagnostic and therapeutic tools; the expansion of fundamental knowledge of human biology and behaviour; and the better understanding of agents that are relevant to human health and disease, including infectious agents and disease vectors. Unlike the findings of country-specific research that may not be readily transferable to other countries, the results of global research are usually cumulative and transferable, and can lead to major advances which can be shared and applied in many parts of the world. It represents a rational long-term investment to equip health services with new and improved tools whose specifications include efficacy, safety, convenience in use and cost-effectiveness. It targets high-priority diseases that are major health problems, and for which effective technologies are not available. The deteriorating situation of malaria in endemic countries is one example of the urgent need to mobilize the modern tools of biomedical sciences; scientists from developing countries are already making important contributions to this global effort.

Whilst the designations “country-specific” and “global” imply different orientations of research, they none the less form a continuum in the scientific approach to health issues. Thus problems identified through country-specific research should determine the agenda and set priorities for global research.

Multidisciplinary research programmes in which field research is closely linked to laboratory research can be powerful ways to identify and tackle health problems.

2.5

Research-Action-Policy Linkages

Dynamic relationships are required between the policy, action and research sectors to increase the demand for health research, accelerate the translation of research findings to policy and action, and expand the use of research findings at all levels of the health system and among the communities. Strong linkages of this type would help to correct some of the faults in existing research systems: failure of policy makers to use research findings in decision making; failure of managers of health care programmes to use research findings and a scientific approach to their planning; failure of researchers to pay attention to problems that are considered to be of high priority by policy makers, health managers and the public; as well as the frequent failure of researchers to either communicate research plans and findings to other constituencies and to communicate them in understandable language.

2.6

Health Research and the Epidemiological Transition

Not only are scientists required to be able to tackle existing health problems, they must also be able to respond to changing circumstances and to adjust their research to address new problems as they occur. Some of the more advanced developing countries have largely overcome the morbidity and mortality due to communicable diseases and are now in the process of epidemiological transition to a stage in which cancer, cardiovascular disorders and other chronic diseases have become major health problems. Local epidemiological patterns at the emergent stage of the new epidemics may provide useful clues on aetiology and preventive measures. For example, in some countries a rising incidence of heart disease and non-insulin dependent diabetes are relatively recent phenomena and are, furthermore, restricted to certain sections of the population. Local scientists seeking to understand these evolving changes may discover ways of developing interventions to control these diseases in their own countries, and their findings could provide fundamental contributions to the understanding of these diseases on a global scale.

2.7

Research Priorities and Scientific Creativity

The priorities for research which emerge from the ENHR process will provide guidelines for setting national research agendas and for allocating research resources. However, good research does not result from a set of stereotypical activities based on prefabricated protocols; the most important element in successful research is the creative mind. The problem solving tasks of goal-oriented research can provide good opportunities for innovation, and scientists should be encouraged to respond creatively.

First-hand exposure to problems in the community can be a powerful incentive to scientists to seek new approaches and redouble their efforts to solve research problems. Without diverting attention from major research priorities, it would be wise to allow scientists a degree of freedom to pursue topics originating from their own initiatives and to explore ideas which may not appear to be of immediate application. Wise research management will ensure that health research guidelines do not develop into rigid bureaucratic controls which stifle scientific creativity.

CHAPTER THREE:

The Institutional Framework

Discussions on capacity for health research often focus on research and academic institutions. These are important resources for the implementation of ENHR strategies and are essential for research that requires high technology equipment and extensive facilities. But the requirements of ENHR extend beyond such highly developed resources, and many additional groups are involved, in communities, non-governmental organizations (NGOs), health service facilities and industry. All such resources are here indicated as “institutions”; all are engaged in research, training and service, but with differing emphases. Each country should identify and mobilize these and all other relevant institutions to expand national capacity for essential health research.

The primary function of each type of institution provides a framework for understanding their respective roles in research, service and training. Thus, the community and its people create the primary demand for research to solve health problems, and they are the users of the results of research. In the ENHR Strategy the community and its people are crucial partners and participants in the identification of problems, the setting of priorities and the carrying out of research based in the community and in the primary and secondary health service centres.

NGOs deliver services of various types to communities and their members. However, they need scientific methods to evaluate the impact of these activities and to solve identified problems. NGOs are also valuable partners in many community-based research endeavours. While members of the communities and NGOs must receive appropriate training to engage in research, they can also contribute to the training of other members of the ENHR research team.

Research is the primary function of dedicated research institutes, but they also provide a resource for training and service. Similarly, the delivery of health care is the primary function of service units, such as hospitals and health centres, but they also contribute to research and training. (Table 3.1, National Capacities for Research, summarizes the multiple functions of institutions in the ENHR Institutional Framework).

The national capacity for health research is built on all these resources. An early and important task for a country's ENHR group is to take inventory of human and institutional resources and to mobilize these resources to meet national priorities. Each group should assess the strengths and weaknesses of their institutions, their current performance and their potential for growth and development. The capacities for health research which different types of institutions can provide is best illustrated by examining specific situations.

3.1

The Role of the People and the Public and Private Sectors

The ENHR strategy is characterized by inclusiveness as it draws on the research capacities in the public and private sectors, and as it ensures an appropriate involvement of communities and the general public:

- **Communities and the general public** have the potential to contribute to the national research effort, not merely as passive subjects of research projects but as full partners in the design, implementation and evaluation of research projects. This important resource is often overlooked in developing countries. Community members, as individuals or through their societies and associations, can raise awareness of the value of research and can stimulate the demand for research on priority issues as perceived by the communities. The ENHR strategy should tap the capacity of community organizations as well as the skills of talented individuals.
- **National governments** have the primary responsibility for promoting, supporting and coordinating national and external inputs and ensuring that the population obtains the fullest benefit from research results. Governments must provide support for health research through investments in public institutions and through grants to other institutions.
- **The private sector**, both commercial and the not-for-profit institutions, also make significant contributions to the research effort. For example, pharmaceutical companies, mostly in the private sector, have the capacity to undertake research leading to the discovery and development of new drugs. In the least developed countries, the pharmaceutical industry is as yet poorly developed but is expanding rapidly in the more advanced countries. As examples of the not-for-profit private sector, non-governmental organizations (NGOs), are mostly involved in the

delivery of health care at the community level and typically serve disadvantaged groups and communities.

Before describing the more traditional research institutions, it is useful to examine the role of communities and NGO's in health research:

3.1.1 The Community

The final test of the value of research results rests with members of the community. They must understand not only the problems but also the proposed solutions and their impact. Members of the community are full partners in the research team and work with researchers from the social, biomedical and other research institutions in the conduct of community-based field research. Communities are not "field laboratories" for researchers from other parts of the research framework.

Community members need to participate in all phases of research – from problem identification through planning design and execution to evaluation of progress and outcomes.

Communities and their research partners can carry out many types of studies of short and long duration through planning design and execution to evaluation of progress and outcomes.

Communities and their research partners can carry out many types of studies of short and long duration. These include short-term epidemiological surveys and attitudinal studies to long-term research on health related behaviours and their modification as well as demographic trends. Clinical trials of therapeutic and behavioural diagnostic agents must also be carried out in cooperation with communities. The long-term partnership of communities and researchers from other parts of the framework offers great potential for the future.

Human Resources

A variety of researchers are needed depending upon the nature of the research and the services to be rendered to and by the community.

- **Community members:** Selected members of the community should receive the appropriate science and research training needed to enable them to be true partners in the research endeavour. Beginning with selected communities, the

community research base should be gradually expanded to involve the entire spectrum of national communities with their various geographic, social, economic, cultural, health and other characteristics.

- **NGO members;** may actually be members of community.
- **Health services;** personnel of all types.
- **Local staff from other sectors;** such as agriculture, transport, education, management, social welfare, business, etc.
- **Research scientists;** The community should have as partners research scientists from those disciplines required to solve the problems at hand. Usually scientists from a number of disciplines will be involved in each research project. Social scientists may include geographers, psychologists, anthropologists, sociologists, economists, political scientists, etc. Health scientists may include clinicians, immunologists, neurologists, microbiologists, epidemiologists, etc. Scientists from the other sectors noted above may also be involved. A multi-faculty university would be a good source for the wide variety of researchers that may be required. Communities and universities may become institutional partners in research.
- **Management staff;** may come from any or all of the institutional partners.
- **Support staff;** may also come from a variety of institutional partners.

Institutional Base

As independent “outposts” from other institutions, research facilities within a community are not only expensive to establish and maintain but may also create barriers between researchers and community members. Communities must become an integral part of the national institutional framework and their members must control what research is carried out. Then problems of goodwill should not arise. When communities and their primary health services adopt the culture and perspective of science, research will become an integral part of day-to-day activities. Analyses, problem solving and evaluation would be considered as normal components of the health programmes. The costs of research will be substantively lower in such an environment and the research will be effective.

Expected Outcome

Community-based research should be the core of the ENHR plan, covering the spectrum from problem identification to trials of interventions. The short-, medium- and long-term research required to solve current and/or emerging problems regarding maintenance of the environment, adequacy of nutrition, changing demography, safety at work, the diagnosis and treatment of increasing and new diseases or disabilities, behavioural changes to improve or maintain health, linkages between economic policy, poverty and health, etc.- should evolve from research among communities and their partners. Similarly, health, social welfare and associated economic policies should be derived from the analyses of community-based research.

3.1.2

Non-Governmental Organizations (NGOs)

Local and national NGOs are usually service oriented and work directly with communities to improve the quality of life of the people, often focusing on deprived groups e.g. women, children, the poor, the handicapped, etc. within communities. They are action oriented and rarely carry out research. They can provide invaluable information about the social and cultural organizations of communities, their economic and health status, their problems and attempts at resolving them. As partners within the national research framework, NGOs could provide a sound scientific basis for their action and evaluate the impact of their interventions over time.

Research Potentials

The close links with communities and their knowledge of them create a great potential for research by NGOs. This would be done in partnership with the community and other members of the national research framework, and would offer several benefits;

- **Problem identification** would be based on sound data.
- **Research** would be carried out on problems of high priority to the community.
- **Priorities for action** would be determined scientifically.
- **Interventions** would be designed and applied using the methods of science.

Human Resources

NGOs include persons with a wide variety of skills, including research. Social scientists of all types, agronomists, engineers, health professionals, management scientists and epidemiologists would be required – and they frequently exist within NGOs. A science culture would have to be established within the NGOs, and some of their staff would receive additional research training.

Institutional Base

At the community level, research activities would take place in cooperation with the community and other partners. At the national level, NGOs could place research into their units responsible for planning and collaboration. Research results should be applied by the community and at the national level, as appropriate. There should be close links between the field research activities and the national offices, with an easy and steady flow of information and results in both directions.

Expected Outcomes

These include:

- better quality information on which to base action
- better evaluation of activities and interventions
- greater impact and sustainability of interventions
- improved health and well-being of community members
- greater credibility for the NGOs.

3.2

The Health Services

The ENHR Strategy is to promote research and to build and strengthen research capacity at all levels of the health services including:

- primary health care in the community;
- hospitals – first referral and district, regional, speciality and teaching; and
- Ministries of Health

For each type of institution within the health services system the research potential, the human and material resources which are required, and the expected outcomes are considered.

3.2.1

Primary Health Care

“Primary health care is essential care based on practical, scientifically sound and socially acceptable methods and technology made universally available to individuals and families in the community through their full participation, and at a cost that the community can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination.”

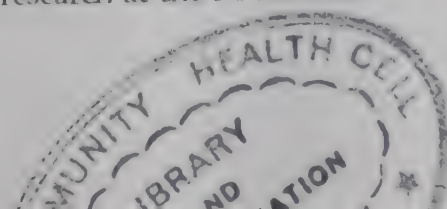
ALMA ATA DECLARATION

The authors of the Alma Ata Declaration of 1978 were explicit in stating that Primary Health Care (PHC) should be based on “scientifically sound” methods. In a further commentary on this issue, the Declaration stated that primary care should be “...based on application of the relevant results of social, biomedical and health services research.”

The scientific basis of PHC is not restricted to the development and application of biomedical technologies but should include the use of research in ensuring equity, cost-effectiveness, effective community participation and other features of the PHC concept.

Research Potentials

A variety of research tasks can be performed at the PHC level, for example, situation analysis through epidemiological, social and behavioural research, and health services research to enhance the impact of health interventions. The PHC programme can provide a useful base for collaborative studies with scientists from more specialized institutions such as hospitals and research institutions. Problems identified and phenomena observed in the field can be the basis for generating research hypotheses for further exploration in the laboratory or elsewhere. In the other direction, laboratory findings and clinical observations on patients in hospitals can be evaluated and validated by complementary field research at the PHC level.



Human Resources

There is need for expertise in such disciplines as epidemiology, statistics, social sciences, behavioural sciences, management sciences and economics. Communication sciences can be used to develop partnerships between communities, health care providers and researchers, as well as to involve communities in informed decision making. Sometimes PHC programmes include professionals who have training and experience in conducting social sciences, epidemiological and health services research in their communities, but in other cases there may be a total absence of trained staff to design and conduct research. Bearing these variations in mind, some broad approaches are suggested to guide the strengthening of human resource capacity.

- **Community participation and control.** In those communities where PHC services are available, community members should participate in the control of PCH and increase the effectiveness of planning and implementation. The poorest and most deprived communities may totally lack PHC services, and for them their own people will be the only resource. Women and children are the principle users of the health care system. Women are often responsible for the health of families, the household environment, water and sanitation, nutrition and the teaching of children. They are the ones who are principally concerned with seeking solutions to health problems and using the outcomes of research. Frequently, training for PHC and related enquiry will be focused on them and they may take the lead within the community to establish and operate primary health care with help of research and scientific information.
- **More effective use of existing professional staff.** The objective is to identify suitable doctors, social scientists, nurses and other health professionals working in the area, especially those who have some research training and experience, update their knowledge through in-service training, encourage them to design and carry out their own research studies and involve them in community-based studies. These research contributions should be encouraged, recognized and suitably rewarded, and involvement in research could be explicit in a post description. The World Health Organization (WHO), the International Research Development Centre of Canada (IDRC), and other agencies have sponsored training programmes on health services research in developing countries. Some national health research programmes are now intensifying such training, including practical workshops to develop projects related to their research activities and providing further support during the implementation and evaluation of the programme.

- **Creation of a science culture and a research orientation among the staff of PHC programmes.** Much valuable information can be gathered in the course of PHC services. For example, maternal and child health services, health and nutrition education, illness treatment clinics, disability and special clinics, etc. The quality of data is determined by the level of staff training and their commitment to full and accurate reporting. It is important that health care givers at the PHC level keep accurate records to enhance their quality of service. Forms for the collection of data should be well designed, easy to complete and adapted to the local situations and use. Local facilities should provide data and analyses to regional and national levels and receive information and analysis from them in return.
- **Technical support from institutions outside the local district.** In situations where local expertise is lacking or inadequate, other institutions may be able to provide the required technical support. For example, in the absence of expertise an epidemiologist in the regional health facility could help conduct local studies, which could also provide an opportunity for training local staff. More advanced PHC programmes may include epidemiologists and health service researchers. These programmes may need to obtain assistance in such disciplines as statistics, behavioural sciences and health economics.
- **Reform of the basic training of doctors and other health professionals.** The inclusion of research training in the curriculum of medical schools and other training institutes for professions ensures that graduates have basic research skills; these can be further developed through continuing education programmes. Some medical schools have adopted curricula which specifically emphasize community based medicine. Other, more traditional, medical schools still put considerable emphasis on biomedical knowledge and technology in the training of their students. Regardless of orientation, all professional schools should integrate research methodology and practical research experience into their training programmes.
- **Collaboration with other sectors.** Within each community and district, health programmes operate side by side with activities in other sectors. This presents many opportunities for multidisciplinary and intersectoral collaboration. For example, where malnutrition is a significant problem, a research project could jointly involve personnel from health, agriculture, education and social sciences, coming from local service or academic units. Such collaboration would provide a

more comprehensive view of the dimensions and determinants of problems, and increase the chances of finding sustainable solutions.

The Institutional Base

Significant research can be carried out with modest resources. Service units – dispensaries, health centres and other groups – can provide bases for epidemiological and health services research. Much of the work will be in partnership with communities, requiring visits to homes. It is important to provide essential resources and logistical support. Types of support include:

- **Transportation.** Lack of transportation can frustrate community research plans. Often, field-based projects have been made possible when a foreign agency has provided a vehicle, but absence of funds for fuel and maintenance can thwart the intentions of the donor.
- **Laboratory support.** Access to simple diagnostic tests can greatly enhance the value of epidemiological studies. Some simple tests such as urine analysis and the determination of haemoglobin levels may be available as part of routine services. Additional tests may be required for specific epidemiological and other studies. There are now simple and highly sensitive and specific tests – serological tests, dot-ELISA tests, DNA probes, etc.- and some of these are packaged as simple kits suitable for use in the field. Alternatively, samples collected in the field can be preserved and sent to a central laboratory. Such technological advances expand the range and facilitate the conduct of epidemiological studies, even in remote areas where sophisticated laboratory facilities are not available.
- **Communication.** Easy communication with district and regional academic facilities increases the efficiency of all research activities. Scientific information and supplies can be attained when needed.
- **Information.** Those working in rural communities may have poor access to information and are often unaware of recent developments in their areas of study. Various programmes have attempted to deal with this problem, for example in Ghana and Zimbabwe medical librarians use CD-ROM technology to obtain abstracts of articles of local interest.

Expected Outcomes

Community-based research provides the communities and the health care workers with information on the health situation and on the operation of the health services.

- **Assessment of the local situation.** This enables communities and authorities to determine health needs and to assess the demand, utilization, efficiency and cost-effectiveness of health services.
- **Adapting services to local needs.** Working within general, national guidelines, research at the PHC level generates knowledge to fine-tune services to respond better to local needs.
- **New diagnostic and treatment protocols.** Local studies in collaboration with other institutions, e.g. hospitals and research institutes, may provide the basis for the formulation of simple diagnostic criteria and effective treatment protocols.
- **Contribution to the national pool of health information.** Findings can augment the national pool of epidemiological knowledge. Local studies on new methods of delivering health care can provide a basis for overall improvements in health care delivery.

3.2.2

Hospital Services

Most developing countries invest heavily in hospital services, which account for 40% to 80% of their national health budgets. The primary function of hospitals is to provide more intensive and specialized care than is possible in the circumstances of PHC. Ranging from small district hospitals to regional, specialist and teaching establishments, hospitals become progressively more sophisticated in the breadth of services which they offer and in the research which they can support.

Research Potentials

This includes:

- more precise definitions of the epidemiological and clinical features of local diseases;
- baseline information to define clinical and laboratory norms;

- in partnership with the community and its PHC system, evaluation and validation of diagnostic criteria appropriate for definitive diagnosis at the hospital level, and of simpler methods suitable for use at the PHC level;
- evaluation of therapeutic protocols appropriate for use at both hospital and PHC levels;
- evaluation of new technologies such as drugs, diagnostic tests and vaccines; and
- basic biomedical research.

Human Resources

Clinicians, nurses, statisticians, social scientists and laboratory scientists are the key people involved in hospital-based research. Their contributions can be enhanced by training in research methods and by collaboration with researchers experienced in other disciplines. The post descriptions of professional hospital staff should include an obligation to conduct research, and there should be provision for recognition of their research contributions.

The Institutional Base

The resources that hospitals require to support research include interactive links with communities and their PHC systems, laboratory facilities, special equipment and additional staff. Access to information is required through library and other services. Collaboration with PHC workers is needed for research on topics relevant to care in the community, such as diagnosis, treatment, referral and the identification of risk factors. Some research topics will require collaboration with researchers in other sectors and disciplines or in more specialized institutions. Time for research is an important aspect.

Expected Outcomes

The expected outcomes from hospital research include:

- Improvements in diagnosis, treatment and management of patients both in hospital and at the PHC level;
- Epidemiological information on patterns of disease;

- Recognition of new disease entities; and
- Advances in the understanding of pathological processes.

The benefits of this research can extend to health centres and other peripheral health units, especially when research is designed and conducted in collaboration with PHC workers. Staff will be trained in research and adopt a scientific outlook to problem solving.

3.2.3

Research in Ministries of Health

Ministries of Health in the regions and the capital are major users of the products of research and should therefore actively plan and implement research projects. Topics of particular significance are health policy research and analysis as well as country-specific research relevant to decision making on strategies and plans for health care. The planning and evaluation unit may itself conduct epidemiological and health services research, or may commission others to do so. Ministries of Health must maintain close links with other members of the national research framework, from the community to academia. There must be a free flow of information and close collaboration amongst them.

Human Resources

Personnel are needed who are skilled in analyzing and interpreting the wide range of findings arising from research projects and who can identify policy implications. The required disciplines include epidemiology, statistics, social sciences, management sciences, health economics and policy analysis.

The Institutional Base

Research activities fit most naturally into the planning and evaluation or Health systems research unit. These groups are often responsible for developing and maintaining information systems for the health services. This arrangement facilitates the linkage between the routine collection and analysis of data, the processing and exchange of information with partners and the identification of issues that require further probing through research.

Expected Outcomes

These include:

- a science culture in the Ministry of Health;
- relevant research projects;
- close collaboration in the use of research and research results within the health services and with the community and academia;
- the implementation of research results into information useful for problem solving from the community to the ministry;
- improved efficiency and effectiveness at all levels of health services; and
- better health for all people.

3.3

Academia

Universities provide a multidisciplinary setting for research on a variety of developmental issues, including health. Faculties of medicine and of health-related disciplines have a primary responsibility for health research, but virtually any faculty member can become involved in some aspect. Strengthening capacity for health research in academia should include harnessing and expanding human resources wherever they are available. Some of the recommendations for dedicated research institutions (see section 3.4) also apply to research in academia.

Research Potentials and Human Resources

The following illustrate the academic potential for health research.

- In the faculties of medicine, **clinicians** and other professionals could acquire the research skills necessary to examine problems which they encounter in the course of their work. They should be oriented towards working with colleagues in other disciplines – social sciences, clinical laboratory sciences, basic biomedical sciences, public health, epidemiology, statistics, behavioral sciences and other areas – in tackling research issues. The role of clinicians in health research has been briefly reviewed in the section on hospital services (see section 3.2.2).

- Similarly, **clinical laboratory scientists** could be oriented towards health research and collaboration with colleagues in other disciplines. Recent advances in immunology, biochemistry and molecular biology offer the anticipation of developing powerful tools for the diagnosis, prevention and treatment of diseases.
- **Scientists in non-clinical departments** (anatomy, physiology, biochemistry, etc.) could relate their research interests to topics of national importance. Thus, for example, they could use parasites, vectors and intermediate hosts as models for experimental work instead of the more traditional models used in developed countries. Their research could also provide clinicians and community-based health workers with tools for research and practice. For example, an anatomist studying skeletal development could provide baseline data and standards for use by nutritionists in defining norms for the growth of children.
- **Biological scientists** working outside health-related faculties could also carry out valuable health-related research. Zoologists could study parasites, their vectors and intermediate hosts. Thus, in areas where schistosomiasis and other snail-borne diseases are common it would be worthwhile to train zoologists for research in malacology. Similarly, where insect-borne diseases are common, medical entomologists should be trained to conduct research on local vectors.
- **Behavioural and social scientists** could be trained and encouraged to study health related issues. Anthropologists can investigate traditional beliefs about health and disease, health-seeking behaviour, attitudes of communities to different types of disease, and other issues relevant to the configuration of health services and the content of messages in health education. The tools of the social sciences can be used to probe and analyze individual and community behaviour. Clinicians and social scientists can often benefit from working together; if they work separately they are liable to miss important clues to the understanding of health problems in the community.
- **Faculties of Engineering** could work on health-related problems such as water, sewage and waste disposal, and environmental degradation.
- **Communication scientists** could conduct research on the delivery of health messages and on the relative efficiency of various strategies for health education. They could seek more effective ways of informing the public and influencing behaviour.

- **Economists** could study the economic consequences of the burdens of disease, the role of poverty in health and disease, the financing of health care and other aspects of the costs of delivery of care and the ability to pay. Policy analysis of health care financing could be an approach to greater equity in health care delivery.
- **Political scientists** could study the processes of decision making at all levels of the health services. Of special interest to ENHR is the meaningful involvement of community representatives in the decision making process.

The Institutional Base

There is a well-founded tradition of research in academia. The ENHR Strategy seeks to mobilize existing resources, direct them towards health issues and expand their capacities to respond. Arrangements should be made to encourage and facilitate inter-faculty and inter-departmental collaboration. In addition to the benefits of interaction between scientists, it may be possible to avoid the unnecessary duplication of expensive research and research equipment in this way. The establishment of institutes or centres of health research, in their broadest sense, may be considered with institutional arrangements for teams of researchers with cross-appointments.

Well equipped library and information systems are essential resources for academia; their relevance and availability for ENHR are indicated in Chapter 4, section 5. Seminars, workshops and conferences on health issues can be used to promote interest in health issues across departments and disciplines.

The training of research scientists and technicians is an important function of academia. Both basic training and advanced training to masters and doctorate levels should be developed and strengthened. Cross-disciplinary training should be encouraged to provide a broader knowledge base to encourage collaboration with scientists in other disciplines. Academia should be closely linked to the other partners in the national research framework and should participate in training researchers at all levels for all partners.

Expected Outcomes

In developed countries and in the more advanced developing countries, universities play a central role in research training and in biomedical and other health-

related research. Fundamental advances arising from academic research have sometimes been further developed into usable tools by the private sector and industry.

The ENHR Strategy can expand and guide research activities in the health-related faculties and can stimulate and mobilize resources by:

- encouraging clinical and clinical laboratory departments to address high priority health problems as seen in the tertiary hospitals and at other levels of care including PHC;
- encouraging preclinical science departments to include topics relevant to local health problems in their research agendas;
- recruiting scientists from other faculties – social sciences, economics, agriculture, biology and physical sciences – to conduct research relevant to health issues either by working alone or in multidisciplinary teams; and
- establishing and strengthening linkages of academics with health policy makers and programme managers.

Academic research is founded on a tradition of critical enquiry and originality. By linking this tradition to important health issues the ENHR Strategy can guide universities to combine excellence of investigation with relevance to the human condition as it is today and may be tomorrow.

3.4 Dedicated Research Institutes

Dedicated research institutions in the social and biological sciences are often prominent features of a country's research resources. Many are government funded, such as the Kenya Institute for Medical Research (KEMRI). Others receive support from external sources which may be national, such as the Research Laboratories in Gambia supported by the British Medical Research Council; or international, such as the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). The scope of institutional research varies; thus KEMRI and the Gambian Laboratories cover a wide range of health problems and research disciplines, whereas ICDDR,B has primarily focused on diarrhoea, although its resources have also been used to tackle some other health problems. National institutions are largely staffed by national scientists and international institutions predominantly by international staff. The tendency for international institutions to be isolated from



national activities is changing; the Gambian laboratories now train technicians and field assistants and provide Ph.D. and postgraduate clinical training for West African nationals.

Research Potentials

Dedicated research institutions are a major potential resource for essential health research, but often the communication and collaboration between their senior staff and national health planners and decision makers needs to be improved. Institutional researchers and managers should be aware of national health problems, so that they can take part in priority setting within a country's ENHR plan and contribute their research skills, disciplines and resources to the implementation of the plan. This research will be institution- and field-based. Field research will be carried out in collaboration with communities and other partners. Research institutions may also be involved in global aspects of ENHR studying such complex topics as drug and vaccine development, and aspects of basic biology and the generic aspects of human behaviour and its changes.

The successful prosecution of institutional research within the context of ENHR requires:

- staff in the form of scientists and technologists, research managers and assistants, maintenance and service staff, and administrators;
- infrastructural support in the form of data analysis facilities, apparatus, animal housing, services and reagents, and buildings;
- information and communications systems, including libraries;
- a plan for institutional research in the context of ENHR, and participation in the development of the national ENHR plan; and
- long-term financial support for staff and infrastructure to ensure continuity of research, retention of staff, forward planning and long-term integration into the national research establishment.

Human Resources (see also 3.6)

Dedicated research institutions require capable scientific, technical and managerial staff with associated career paths and salary structures. Trainees for all levels (Ph.D., Masters, technical and management) should be accommodated in appropriate programmes. Thus, association with academia is important, if not essential.

Institutional Base

This should provide all the scientific requirements and support for first class research. Links with communities, health services, academia and other institutions are essential. Appropriate arrangements to finance research and support services is a crucial element.

Expected Outcomes

- Research findings are the major output. Institutions should strive to ensure that research findings reach those who can use them. Channels include formal publication in refereed journals, newsletters, seminars and meetings, and informal contacts. Executive summaries of findings in non-technical language can assist health planners in evaluating the relevance of research findings to health service activities.
- A resource for research available for collaboration elsewhere in health research projects.
- A resource for research training for scientists and technicians.
 - A resource of knowledge and experience available for peer review, for work with others on national health research policy formulation and to provide a national voice in international health research planning.

3.5

Research in Industry

In developed countries the pharmaceutical industry is a major resource for research, seeking new tools for disease prevention, diagnosis, treatment and control, often by building on findings of fundamental research. Drug development includes screening and safety testing on animals, formulation of products, evaluation and testing on humans, and completion of protocol requirements for drug licensing agencies. The chemical industry is similarly involved in the development of pesticides for vector control.

The more advanced developing countries are now building up pharmaceutical industries which conduct research and development, with some involvement in research on local problems. In less advanced countries the pharmaceutical industry is relatively small and does not have a significant research base, being chiefly involved in the compounding of drugs obtained by bulk purchase of ingredients.

Research Potentials

Research capacity in industry can contribute to national programmes through the training of scientists and technologists and through collaborative research. For example, an industrial laboratory involved in vaccine formulation may be able to provide diagnostic services for an epidemiological project. Other “for profit” corporations and companies also carry out research and can contribute to the achievement of national essential research goals and plans. Public information and communication companies, public opinion companies, social sciences research and consulting companies, and management consultants of all types are but a few examples of “for profit” organizations carrying out research. These organizations can help in national health research efforts either on a profit basis or through donation of staff time for research. Such organizations can also be linked to other research institution in collaborative efforts of national interest related to a country ENHR plan.

Human Resources

The “for profit” sector is usually staffed with excellent researchers and support staff with associated career paths. In fact, this area attracts researchers and support staff from the “public sector.”

Institutional Base

Facilities and support are usually excellent but focused upon the goals of the company. Links and activities in the ENHR process may necessitate strengthening in some areas, but the resources for this should come from the organizations themselves. Training for specific skills can also take place in these organizations.

Expected Outcomes

Usually, outcomes are related to company goals and plans. A proportion should be related to carrying out specific projects within the ENHR plan.

3.6

Development of Human and Institutional Resources

The various parts of the national institutional framework, as described in the previous sections, have much in common regarding the development of human and institutional resources. Some common issues are discussed below.

Researchers and their Careers

Research workers are the product of science education in schools, technical colleges and universities, and scientific literacy is the foundation of professional research. Training is needed for scientists, technical staff, administrative staff, field workers and other support staff. There should be open competition and careful assessment of candidates; training should be in the context of national and institutional priorities and plans, and should take place within or under the umbrella of the national institutional framework. Training is considered in more detail in Chapter Four of this document.

Of equal importance to training is the provision of careers which are sufficiently rewarding to attract and retain first class scientists. Recognition of achievement, an adequate and stable salary structure, and freedom to exercise initiative in research are the most important elements. Institutional and national career structures are needed. Career Development Fellowships, such as those awarded by the International Health Policy Programme (IHPP) and WHO's Tropical Disease Research Programme (TDR), have proven successful for the support of the early career stages of trained scientists. In the past, successful research workers have often been attracted to become administrators by higher salaries. This loss may be reduced by setting up parallel career structures and salaries for those working on research and for those in administration.

A visiting scientists programme can bring new ideas in science, help generate local enthusiasm and promote leadership. Visitors can serve as role models. This programme may be part of wider linkages with more developed institutions, with joint research projects and mutual interchange of staff and training programmes.

The Institutional Base

Capacity strengthening activities should focus on existing institutions carrying out health research of national relevance. New institutions should be created only if absolutely necessary to achieve national health research goals.

Subject to limitations of size and resources, the role of institutions participating in ENHR is to:

- take part in the country's ENHR planning and in the consequent links between communities, health care providers, research workers and policy makers;

- prepare an institutional research plan as part of the ENHR Strategy and timetable to achieve goals within the national plan, including both short-term and long-term targets and timetables; and review the plan and timetable annually;
- develop and carry out research projects under the plan;
- establish an inventory of staff and material, and list additional requirements on the basis of the institutional research plan;
- conduct a training programme for scientists and technicians on their own staff and in other institutions;
- establish a staff career structure capable of attracting and retaining productive scientists and other workers;
- prepare an annual scientific report and budget, forecast longer-term budgetary requirements and seek sources of funding;
- create an environment supportive of research, including the able direction of research projects and institutional research policies.

Financial Support

Financial support for institutional strengthening should be used to implement a well-defined development programme. Past experience has shown that project support alone is not sufficient for institutional strengthening; it should be complemented by programme-based institutional strengthening grants, usually to support infrastructural needs such as training, research facilities and administration costs. There may be a need for capital development grants for major resources including new buildings. Flexibility in the application of funds can be valuable, as can hard currency, in obtaining essential supplies and equipment.

CHAPTER FOUR:

Lessons from the Past

There are important lessons to be learnt from the accumulated experience of past attempts to build and strengthen research capacities in developing countries. Some programmes have been outstandingly successful; others have been dismal failures. Analysis of factors which predispose to success or failure can be a valuable guide for policies relating to the ENHR Strategy.

4.1

National Commitment to Health Research

This is crucial. It includes stable financial support at a realistic level, demand for and utilization of the results of research, and creation of a science and research environment that attracts, trains and employs able scientists in an atmosphere of objective enquiry. Governmental priority is indicated by how much it invests in building and maintaining the infrastructure of health research, in supporting research projects and by continued support in times of financial stringency. Governments of some developing countries have treated research as a luxury item – the last to be included when funds are available and the first to be cut when money is short.

Human resources. Support should be given to research training and the development of science. Policies should be designed to attract and retain good scientists and other research workers, especially through the establishment of career structures and reward systems that recognize excellence and achievement. Science policies should also include the need for up-to-date information and links with the international science community.

Utilization of research findings. Relevant research findings should be promptly translated into changes in health services policy, into health strategies and into evaluation of the performance of health services. Interest shown by government in the findings of scientific analysis and research is an important reward and spur to greater achievement by research workers. Research results must be presented in a way which is both understandable and useful to policy and decision makers.

Political interference. In the past, some governments have shown a lack of commitment in their treatment of research findings, ranging from benign neglect to active suppression of information and open hostility to the scientists who generate the findings. There have been attempts by governments to prevent the publication of research findings that may reveal the gravity of some health problems and the difficulties national authorities have had in dealing with them. Researchers must understand the pressures for action and the short time-frame facing political leaders. In presenting the results of ENHR projects researchers must take these pressures into account, or the results of research will never be used.

4.2

The Training of Research Workers

“ENHR’s mode of operation is characterized by inclusiveness, aiming to involve researchers, health care providers and representatives of the community in planning, promoting and implementing research programmes.”

COMMISSION ON HEALTH RESEARCH FOR DEVELOPMENT

These characteristics imply a wide scope of research disciplines, approaches, expertise and training. They implicate not only scientists involved in research as their major occupation, but also community members, doctors, nurses, health assistants and others involved in health care in hospitals, health centres and in communities. Training in research is the foundation of ENHR activities; research orientation should be included in all professional and technical training and should continue throughout the career of all individuals working in the field of health.

In addition to traditional discipline-based training for research, the ENHR Strategy should include training to:

- identify and address the dimension of equity in health and development;
- make all research ethical;
- appreciate that good research is both rigorous and relevant to the improvement of health over the short-, medium- and long-term;
- target research on health problems rather than disciplines, and in so doing collaborate with researchers in other disciplines and sectors;

- analyze and synthesize research findings to maximize potential health benefits; and
- monitor, evaluate and document the impact of health research on those people who are expected to benefit.

Training for research to carry out an ENHR plan is not necessarily confined to traditional health-related disciplines. For example, training might include how to communicate research findings and their health implications to the general public; and the training of accountants in health policy, following the lead of the International Health Policy Programme.

4.2.1

Training for Research within the Community and Primary Health Care

The needs and circumstances of research at the community and PHC level are determined by existing health problems and economic, social and cultural backgrounds. Table 4.1 provides a framework for research training in PHC. It is illustrative rather than prescriptive; entries indicate the desirability of training, but the absence of an entry does not preclude training in appropriate circumstances.

Topics for Training

- **Epidemiology and biostatistics.** Training should include an understanding of how to identify health-related problems in the community, indices of their severity, possible ways to remedy them and ways to assess the effectiveness of control activities. Training should include the understanding of the broad principles and the application of epidemiology and statistics, but training in formal mathematical approaches may not be necessary.
- **Data collection.** This includes qualitative and quantitative methods in community-based research and is a basic requirement for much research at the PHC level.
- **Surveys.** How to plan and conduct a survey. The principles of design, administration and analysis of surveys as well as qualitative data.
- **Communication skills.** How to get a message across to an individual or a group and how to understand messages coming in the other direction.
- **Social understanding.** An appreciation of social structures and organizations of families and communities and of their implications for health care.

Types of Training

- **Professional Training.** This is the formal training required for doctors, nurses and others to obtain a qualification to practice.
- **Short courses.** Periods of full- or part-time training on specific topics, of durations ranging from a few days to a few weeks.
- **On the job.** Training during the course of work, given by a more experienced individual or group. Training by involvement in ongoing research is especially valuable.
- **Other experience.** Experience of research in a different but related activity. For example, community members, social scientists, doctors and nurses working in community PHC and in health centres may benefit from periodic exposure to hospital-based research, and *vice-versa*.

The Trainees

- **Doctors and nurses.** The professional training of doctors and nurses working in PHC should include all the topics indicated in Table 4.I. An important part of their task is to impart skills and attitudes of systematic enquiry and research to other PHC workers. They will require periodic refresher training, and the sharing of experiences of problems and solutions with other professionals is important.
- **Social Scientists.** Individuals from all the fields of social sciences should receive exposure to the health system.
- **Health assistants, PHC workers and health promoters.** The training of this group should help them to understand the importance of systematic analyses of health problems and of the effectiveness of health measures.
- **Communities.** Needs and opportunities for training will depend on local health problems, social and economic circumstances and local cultures. Appropriate trainees may be school children, teenage girls, women's groups, child care providers, community leaders, professionals, NGO members and practitioners of traditional medicine. Examples of topics for training are how to choose and set priorities, elementary health care (including clean water and vaccination), human relationships, nutrition, life-style, family planning and the control of infectious diseases. The ENHR strategy introduces the concept of equity and emphasizes the important elements of enquiry and judgement. How better could local needs

be met by PHC? Does the village pump work, and if not how can it be repaired? Are devices to prevent infection, such as bed nets against malaria, in use and effective, and if not, why not? Is guinea worm infection understood, and are water filters to remove the Cyclops host effectively used? Such local enquiry, far removed from the strict formalities of statistical assessment and peer reviewed publication, has a practical role to play in bringing health benefits to communities, especially the poor and disadvantaged. Enquiry will also help communities to choose their priorities, as part of the larger, national planning process.

4.2.2

Training for Hospital-Based Research

As noted above, training for doctors and nurses should include an understanding of the elements of epidemiology and biostatistics, including the conduct of surveys. Training should stress the importance of research, not only to improve hospital-based diagnosis and treatment, but to devise improvements in health management which can be applied more generally in the community. Training should also include general management, social science and technology assessment.

4.2.3

Training for Professional Research Workers

These are the people whose major activities and careers lie in research. Most of them work in dedicated research institutions, universities and technical colleges, but some, including epidemiologists and social scientists, may work in Ministries of Health or in field projects.

Under the ENHR strategy, quality of research is judged not only on the elegance of biomedical findings or the sophistication of econometric models and policy analyses, the research must also be relevant to priority health problems. Exposure of professional research workers to first-hand experience in the circumstances of life in depressed areas of poor health can trigger creative thinking and increase motivation to ensure relevance.

Technicians. Skilled and experienced technicians are essential members of research teams; they may introduce technologies and conduct research activities without supervision, but are not responsible for project and experimental design or the analysis of findings. Technicians usually receive vocational training by diploma and other training courses, by hands-on demonstrations and through learning by

doing. So far as possible, technologists should be trained locally or nationally within established research laboratories and technical colleges. Part-time training can be appropriate for technicians holding junior positions.

Scientists. The training of professional investigators is expensive, time consuming and a major national investment. Candidates must be carefully selected, and intelligence, an enquiring frame of mind, originality and enthusiasm for research are essential. Most candidates will have degree-level training in medicine or another science-related subject. Candidates should be aware of likely career prospects and of the hard work and commitment required for a successful research career. A period of elective work in a research laboratory can be valuable in helping a young candidate to sample the environment of research, and to give some indication of capabilities.

Scientific training is demanding. The aim is to encourage creativity, originality, a critical and analytical approach to problem solving and an understanding of the rationale and methodology of scientific investigation. Training by doing is the usual approach, often taking the form of master's, doctorate or post-doctorate degree courses under supervisors who are themselves experienced investigators. Training within the candidate's own country is desirable but, in the past, lack of experienced supervisors in developing countries has led to many candidates being trained in industrialized nations. Frequently, training can be achieved through partnership arrangements between institutions one of which is in the home country where at least some of thesis work should be done. Scientists who become research administrators or managers will require additional training according to their tasks and experience.

4.2.4

Training Programmes

In the past, a variety of training programmes for developing country research workers have been sponsored by governments, bilateral and multilateral agencies and foundations. The results have varied. Sometimes research institutions have acquired sufficient trained scientists to conduct worthwhile research, but in other cases training has been less successful. Either the trainees have remained abroad (the so-called "brain-drain"), or after their return home have abandoned a research career. Many sponsors now take the view that the award of research training fellowships should not solely be based on candidates' abilities. Failure to relate fellowships to research opportunities, needs and resources may produce scientists who cannot find

suitable employment on their return home or who become disillusioned by the lack of resources on returning to ill-equipped or under-funded institutions.

There are various ways by which these unsatisfactory outcomes may be made less likely. Paramount is the need to consider training together with careers, as an integral part of institutional and national research plans. This will permit individual trainees to foresee the earlier stages of their research careers, pursue the appropriate topics and acquire the necessary skills. Training should be oriented towards the home institution's requirements, research environment and resources. Thus a topic for Ph.D. training would be chosen on the basis of an institutional and national plan, and although some of the work might have to be done abroad, the final stage of practical studies would be completed in the home institution, under the direction of the external supervisor – a “sandwich course.” A follow up, “re-entry” grant could then be awarded for the purchase of equipment and other resources required to continue the research after the period of training, along the lines now well established under WHO's Tropical Diseases Research Programme (TDR).

Training scientists as close to their home base as possible has several advantages. It is cheaper, the trainee can keep closer contact with his home institution, and he or she is more likely to return home after training. Home-based M.Sc. programmes avoid the need to travel. Part of the ENHR effort to strengthen research capacity should be to develop and strengthen local and regional training facilities.

Evaluation. Regular evaluation of training programmes at all levels is essential. It should take into account relevance and linkage to ENHR needs and goals, the achievements of trainees, scientific merit and the need to train for research leadership.

4.3

Research Projects

These are the major units of research investigation. Within the framework of ENHR, a project proposal identifies a problem for research. It also indicates the research plan and methods to be used in solving the problem, describes both the human and material resources which are required for the work, and indicates the significance of the findings in relation to institutional and ENHR plans. A project budget and a “time-plan” are crucial and will be needed if the project is to be submitted for peer review and/or for external funding. The project proposal is prepared by the scientist on the team which will conduct the research, who may be

assisted by other scientists in the institution or identified through the ENHR mechanism. Proposals can benefit greatly from review by scientific peers for scientific quality and for relevance to health research priorities. Such peer review may be at the institutional, national or international level. External reviewers will be needed if the necessary expertise is not available within the country. The system of research proposals and peer reviews is a proven tool in the advancement of research and an integral part of the project funding mechanisms of international programmes such as WHO's Tropical Disease Research Programme (TDR), Global Programme on AIDS (GPA), and Programme for Research, Development and Research Training in Human Reproduction (HRP). It can be applied to research at many levels in the health system, including, in broad principle, at the PHC level.

The final stage of a research project is the dissemination of the results to users; publication and acceptance by a refereed journal is an important criterion of research quality. Health research project reports should include a non-technical summary of findings for use by the Ministry of Health and others.

4.4

Institutional Development

The successful development of all types of research institutions, including the initiatives in the communities and districts, depends upon many internal and external factors.

- **Leadership.** Some research institutions go through phases of high productivity and achievement, interspersed with less productive periods. Often, these changes reflect the quality of leadership, and the role of the research leader or director is crucial. An inspiring leader has a clear and uncompromising commitment to high research standards and provides vigorous support for his or her staff. This person sets the tone of the institution and can stimulate or stifle good work. High research achievement is a valuable asset but is not of itself sufficient. Key requirements are insight into the processes of research, the ability to attract and recruit talented young scientists and to provide them with a stimulating research environment. Efforts should be made to identify potential leaders, and to train them in advance for this demanding job.
- **Management.** Managers work with research directors to match the needs of research to available resources, and in smaller institutions one person may do both

jobs. Managers deal with such matters as finance, procurement, organization, discipline and the maintenance of buildings and major equipment. Managers should be aware of the dangers of excessive bureaucracy. It is important to give scientists the opportunity to acquire management skills through formal training and by progressively increasing responsibilities.

- **Staffing.** In addition to trained scientists of all types, the success of research programmes depends on a range of support staff. These include technologists, computer programmers, animal house attendants and maintenance personnel. Larger institutions will need the services of trained librarians.
- **Financial support.** Continuity of financial support is essential. In the past, downturn in the national support of some institutions in developing countries has sometimes coincided with the withdrawal of external support. Assured support permits scientists to plan and implement long-term projects and should be based on a well-defined development programme. Experience has shown that project support alone is insufficient for institutional strengthening; it should be supplemented by programme-based strengthening grants, usually to support infrastructural needs such as training, research facilities and administrative costs. Flexibility in the application of funds is desirable, since hard currency, which may be needed for essential supplies and equipment, may not otherwise be available. Frequently, there will be a need for capital development funds for major resources, including buildings.

4.5

Communication and Information

Communication is the life-blood of research and is critical if the various partners in the research framework are to work together successfully. It takes place in many ways; informal contacts between researchers, including day-to-day contacts, seminars, journal clubs, courses, workshops, meetings and the like; contact with research workers in related fields, both national and international; attendance at meetings of scientific societies; and access to scientific literature through journals and other forms of information transfer. Researchers in developing countries are often handicapped by poor communication and information, and ENHR groups should actively encourage scientific contacts and support measures to improve access to scientific information. Communication among scientists should cover those within a country as well as those in other countries.

Access to a comprehensive information system, including journals, a library including a CD-ROM literature data-base and computer systems is essential. Communications technology is a rapidly developing field and advanced rapid information systems such as Satelife and Healthsat should be utilised. Larger institutions will have a comprehensive system in-house; smaller groups will have more limited resources and should supplement them with access to the facilities of larger institutions.

4.6

The Role of External Agencies

Many international agencies have been involved with programmes for building and strengthening research capacities in developing countries. WHO's initiatives include the HRP, TDR, GPA, the Health Systems Research Programme, and Control of Diarrhoeal Diseases (CDD); the European Community Science and Technology for Development Programme; bilateral programmes such as those of the Canadian International Development Research Centre (IDRC), the Swedish Agency for Research Cooperation with Developing Countries (SAREC); and private philanthropic foundations such as the Rockefeller Foundation's International Clinical Epidemiology Network (INCLIN). The Tropical Medicine project of the South-east Asian Ministers of Education Organization (SEAMEO-TROPMED) offers postgraduate training in tropical medicine and public health and supports research on tropical diseases. The International Child Development Centre (ICDC) is a UNICEF facility in Florence, Italy, which fosters self-sustaining learning in African countries related to the changing needs of children.

The impact of international programmes has varied. In some countries, their support gave impetus to a national programme for capacity strengthening, catalysing new activities that were subsequently sustained and expanded by national authorities. In other cases, the supported institution achieved good results only for as long as external aid was available. Sustainability is, therefore, an important consideration when using external aid to develop research capacity. The external investments should be in the context of national programmes for research strengthening, and commitment by the national authority to sustain activities when this aid comes to an end.

CHAPTER FIVE:

Implementation and Coordination

“The linkage between research and the utilization of research results needs to be strengthened through greater participation of research users in setting the objectives and timetable for research projects, and through more effective communication of results to potential users.”

COMMISSION ON HEALTH RESEARCH FOR DEVELOPMENT

This document has described how the resources and capacities to implement the ENHR Strategy extend throughout the health and health-related research systems. It has shown how those working in all these areas are involved, indicating that a special responsibility falls on research managers at all levels. The requirements of the ENHR Strategy are diverse, varied and changing. The process should be “institutionalized” or formally organized within a country to plan, promote, harmonize and coordinate activities. This organization, or “ENHR mechanism”, has been extensively described in the monograph *A Strategy for Action in Health and Human Development*. A major task is to oversee the progressive strengthening of research capacity, and to do this the mechanism develops national plans and strategies, mobilizes resources and coordinates the efforts of the wide variety of participants in the ENHR process.

5.1

National Plans and Strategies for Capacity Strengthening

The “ENHR mechanism” assesses the current status, prepares an inventory of research capacity and identifies gaps and weaknesses. It takes the lead in establishing channels of communication between representatives of communities, policy and decision makers and researchers. Through consultations with these groups it defines goals for capacity strengthening in critical areas and makes plans and strategies to achieve them. Several countries are now generating ENHR plans in this way.

5.2

Mobilization of Resources

Governments should “invest at least 2 percent of national health expenditures in research and research capacity strengthening, and at least 5 percent of project and programme aid for the health sector from development aid should be earmarked for research and research capacity strengthening”

COMMISSION ON HEALTH RESEARCH FOR DEVELOPMENT

The primary responsibility for financing activities to build research capacity lies with national governments, and other national and external sources of financing should be explored to complement this funding. The Commission's attractive recommendation builds the allocation of research funds into the health service budget and into major health programmes from external sources. Thus, a percentage (2-3 %) of national health plans funded through the World Bank or IDA loans should be devoted to research. Most developing countries depend largely on government funding and external aid for their research programmes, but some private sources are becoming available from affluent individuals and organizations which have established private charitable foundations. A few public charities also support health research in developing countries.

In developed countries, health research is financed from several sources:

- the government, through research councils, national councils for science and technology, and similar bodies;
- private, philanthropic foundations;
- public, charitable organizations;
- academia, from grants in support of higher education and research; and
- industry, pharmaceutical and chemical.

An important task for a country's “ENHR mechanism” is to increase the flow of resources to support health research and the strengthening of research capacity, and it should do this by promoting a broad awareness of the ENHR concept, process, plan and achievements. Targets should include government ministries of finance and planning, the population in general and the private sector. The aim is to engender

appreciation of the benefits of research in terms of advances in health and development, cost-effectiveness and the improved health and well-being of all people.

5.3

Coordination

The “ENHR mechanism” can serve as the central health research coordinating body to strengthen research capacity by collecting and disseminating information which includes:

- **Databases of resources.** This includes qualified scientists and their expertise and research experience; research institutions and their main areas of work; community-based research and major ongoing research projects inside and outside the ENHR plan.
- **A database of scientific publications.** This includes listings of research publications in local, foreign and international journals; theses, dissertations and books; proceedings of conferences; consultants reports; and special literature reviews. It would be especially useful to include fugitive literature, i.e. material not published in indexed journals, such as occasional reports and proceedings of scientific meetings. Such a database would provide an important assessment of research capacity in terms of output.
- **Networking and integration of research.** As noted previously, progress in research depends not only on the individual efforts of researchers or teams, but also on interactions between researchers to bring different perspectives, ideas and skills to problem solving. Isolated researchers who lack such contacts are disadvantaged. Interaction between scientists is especially important for ENHR, where interdisciplinary research is often essential. For example, studies to improve malaria control may involve epidemiology, entomology, clinical medicine, immunology, pharmacology and therapeutics. “Networking” indicates collaborative research by scientists in different groups, disciplines and institutions, either within a country or across national boundaries. Thus neighbouring countries having similar ecological features may find it advantageous to network research on common aspects of vector control. More broadly still, international resources may be deployed when specialized and diverse resources are required as, for example, in malaria vaccine development, and such networking often involves South-North collaboration. Networking is the *modus operandi* of large, international programmes such as HRP and TDR.

Allied to networking is the need for integration of research. For example, in a country with a high prevalence of HIV infection several research teams funded by external donors have obtained much information on the epidemiological and behavioural aspects of the infection. However, since two different types of studies were done in different communities, it has not been possible fully to interpret the epidemiological significance of the findings on behaviour. Integration of research can make more effective use of limited resources and provide a powerful way to generate new knowledge.

Scientists in developing countries often lack the opportunity of interaction with colleagues working in similar or related disciplines, and there are difficulties in communication across disciplines and institutional, sectoral and geographical boundaries. Some scientists have recognized these problems and have formed groups to overcome them on a disciplinary basis, such as national societies for immunology. The “ENHR mechanism” could promote and initiate internal and intercountry networks, beneficial to health research.

Close interaction is needed between scientists and the givers and receivers of health care. This should enable scientists to have a fuller understanding of health problems in communities and should help health care givers to appreciate the nature and applicability of research and research findings. It is important that the technical language of science does not form a barrier between scientists, health care providers and the population. The practice of writing executive summaries of research projects and findings in non-technical language should be encouraged.

5.4

The ENHR Ethos

The objective and orientation of the ENHR Strategy is to ensure that health activities and services are founded on scientific knowledge and based on scientific methods, and that research efforts will lead to improvements in the health and well-being of all people. More than technical expertise and research capacity will be required if the ENHR Strategy is to succeed as an essential link to equity in development. An ethos, a philosophy and an ethic, is needed which transcends the traditional substance and methods of health research. Health care has an honourable tradition of dedication and service. ENHR includes that tradition and extends it to include the obligation to scientific research and enquiry.

5.5

Ethics in Health research

Every country, agency, organization and institution must have guidelines for the ethics of research. Countries should also have appropriate legislation. Such guidelines relate not only to research involving human subjects but also to research involving animals, the environment, and to research carried out by organizations and groups from outside the country, either alone or in partnership with national institutions. Many countries and institutions do not have such guidelines or the necessary legislation and national institutional arrangements. Their establishment and effective operation are crucial components of the strengthening of national research capacity.

Guinea, one of the world's poorest countries, has created a remarkable set of decrees, guidelines and organizational structures as an integral part of their ENHR Strategy, which can serve as an example to other countries. The Guinean arrangements are based upon the recommendations of the Council for International Organizations of Medical Sciences (CIOMS). This organization has published International Ethical guidelines for Research involving Human Subjects (1993) as well as for Epidemiological Research (1992). CIOMS can provide information and names of possible consultants to any country or institution wishing to establish structures and procedures to assure the ethics of research.

5.6

Evaluation

The long-term goal of ENHR is to enable all parts of the health system to apply science and knowledge-based decision making at every level of activities, and ultimately all capacity-strengthening programmes should be evaluated on this basis. However there are intermediate indicators of progress. Thus, the national plan for capacity strengthening should set out activities and goals in clear and objective terms, with defined bench-marks. The numbers of scientists trained and active in particular disciplines, the establishment and equipment of research teams, institutions and networks, and the provision of research funds are quantitative indicators of progress. Other useful indicators are the use of strengthened research capacity to address priority health problems and the outcomes. The dissemination and publication of research findings and the discovery through research of new approaches and technologies to improve health are also valuable indicators.



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